Green Horse Habitat Restoration and Maintenance Project

Inventoried Roadless Area Report

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1. INTRODUCTION

The Green Horse Habitat Restoration and Maintenance Project (Green Horse Project) proposes to reintroduce fire onto the landscape through the use of prescribed fire and other connected actions. Several treatments will occur within the Devil's Rock Inventoried Roadless Area (IRA). An IRA is generally a large contiguous tract of land with few to no roads. IRAs were first identified during the Roadless Area Review and Evaluations in 1972 (RARE I) and 1979 (RARE II). The RARE studies identified large contiguous tracts of land or lands adjacent to existing wilderness areas that had the potential for wilderness designation because they exhibited little evidence of past management and development. The 1984 California Wilderness Act designated several IRAs on the Shasta Trinity National Forest as wilderness but did not designate the Devils Rock IRA. The Devil's Rock IRA was one of 29 IRAs that were "released" from more restrictive management back to non-wilderness multiple use management. The Forest's 1995 Land and Resource Management Plan (LRMP) acknowledges the effect of the 1984 Act and allocates the Devil's Rock IRA to several management prescriptions other than wilderness management (USDA Forest Service 1994a, pg. C-8 to C-13).

Management of the Devil's Rock IRA changed again in 2001, when the Roadless Area Conservation Rule (2001 Roadless Rule) was adopted. The 2001 Roadless Rule prohibited (subject to a few narrow exceptions) road construction and road reconstruction as well as timber cutting, sale, or removal within Inventoried Roadless Areas throughout the United States (Roadless Area Conservation rule of 2001). These nationally applied prohibitions overrode any land management plan prescriptions for the previously released inventoried roadless areas. The 2001 Roadless Rule was subjected numerous lawsuits in multiple Federal courts. While some of those lawsuits were still active, the State Petitions Rule was promulgated which superseded the 2001 Roadless Rule (State Petitions for Inventoried Roadless Area Management Rule of 2005). However, a subsequent lawsuit successfully challenged the State Petitions Rule and the court reinstated the 2001 Roadless Rule. Two circuit courts later upheld the lower court's decision (California ex rel. Lockyer v. USDA 2009, Wyoming v. USDA 2011). By the end of 2012, all lawsuits challenging the 2001 Roadless Rule had been resolved (outside of Alaska) and the 2001 Roadless Rule was upheld as the law of the land.[1]

The purpose of this analysis is twofold. First, it will determine whether the activities proposed under Alternatives 2 and 3 of the Green Horse Project comply with the 2001 Roadless Rule (2001 Roadless Rule, p. 3272-3273). Second, it will analyze the effects of these activities on the "Roadless Area Values and Characteristics" identified by the 2001 Roadless Rule (2001 Roadless Rule p. 3245). The Roadless Area Values and Characteristics are described as follows: high quality or undisturbed soil, water and air resources; sources of public drinking water; diversity of plant and animal communities; habitat for threatened, endangered, proposed, candidate, and sensitive species and species dependent on large undisturbed areas of land; Primitive and Semi-Primitive Non-Motorized, and Semi-Primitive Motorized classes of Dispersed Recreation; reference landscapes; natural appearing landscapes with high scenic quality; traditional cultural properties and sacred sites; and other locally identified unique characteristics.

1.1 Existing Condition, Proposed Action, and Alternatives

The FEIS for the STNF Land and Resource Management Plan describes the Devil's Rock IRA as follows, "This area is located near the Pit River Arm of Shasta Lake, approximately 24 miles northeast

[1] Certain exceptions apply in Alaska, Idaho, and Colorado, but all IRAs in California, including the Devil's Rock IRA are currently subject to the 2001 Roadless Rule.

of Redding. The Limestone outcroppings are visually pleasing. The Shasta salamander, which inhabits the formations, and the sensitive plants within the area are the prime ecological features. Elevations are low, mostly 1,500 to 2,500 feet, with Brock Butte peak at 3,459. Recreation use is light and consists primarily of hunting big game and wild turkey."

Current observations made within the IRA indicate that it is primarily forested with closed canopy mid-seral forest except where large rock outcroppings occur. Mortality of canopy trees within the IRA is generally low. A large portion of the IRA has a dense canopy with little undergrowth however some areas do have a shrub and brush layer.

Within the project area as a whole, past management activities, including more than a century of fire suppression, have disrupted the historic fire regime and led to the current vegetation conditions, which are characterized by low structural diversity and overall poor quality of wildlife browse and other habitat components.

Fire suppression has also resulted in high fire hazard (as defined by fuel loading and vegetation densities) and high fire risk (as defined by fire start occurrence). Recent fires near or within the project area have included areas of high fire severity where high levels of soil erosion, loss of wildlife habitat and degraded scenery occurred. In addition, these fires resulted in the loss of several structures and produced pollution levels that exceeded air quality standards.

The Purpose of the Green Horse Project is to protect, enhance or maintain wildlife habitat quality, including threatened, endangered and Forest Service sensitive species; trend the area toward historic fire regime conditions; reduce the risks and consequences of public health and safety concerns related to poor air quality during wildfire events; and protect, enhance or maintain scenic values, campgrounds, trails and other recreational values in the project area.

The major activity proposed under the Green Horse Project is burning the landscape through the use of prescribed fire. Some areas around private land and bald eagle nest sites will be thinned and pruned by hand, followed by piling the cut material, burning the piles, and (when desirable and feasible) underburning the thinned area. For the rest of the IRA report I refer to this suite of treatments as "thin/prune/pile." Dozer line (fireline constructed by bulldozer) will be constructed in a small area of the project. Handline (fireline constructed using hand tools) will be constructed as needed around private land and sensitive resources (such as historic and prehistoric sites) to protect them from fire. All of these treatments, other than dozer line construction, will occur within the 16,150 acre Devil's Rock IRA.

The following subsections describe the activities that fall within the Devil's Rock IRA under the project alternatives.

1.2 Activities Proposed within the IRA under Alternative 2

Within the IRA, 22 acres of the IRA along private property boundaries will receive the thin/prune/pile treatment (See Figure 1). Regarding the thinning, small conifer trees up to 8.0 inches in diameter would be thinned, to an average spacing of approximately 15 feet. Hardwood species up to 4 inches in diameter would also be thinned, retaining a minimum canopy cover of 75 percent where it already exists. Brush cover would be reduced to encourage surface fire rather than crown fire behavior during burning. The thin/prune/pile treatment will only occur within a 50 foot buffer along private property boundaries in the northwest portion of the IRA. Where this occurs, the private property boundary is also the IRA boundary, so these 22 acres of thin/prune/pile will occur on the outermost 50 feet of the IRA.

Within the IRA, there is one known bald eagle nest site. Thin/prune/pile will occur within 300 feet of

this nest site for a total area of 6 acres. Thinning around bald eagle nest sites is limited to the same range of sizes as is established for thinning along private property (8 inch diameter maximum for conifers and 4 inch diameter maximum for hardwoods). If bald eagles create any new nest sites within the IRA during project implementation, thin/prune/pile will occur around those nest sites as well.

Within the IRA, there will be no dozer line construction. Some handline construction may occur around private property, bald eagle nest sites, and around certain sensitive environmental or cultural resources that require protection from fire. Since handlines can attract illegal Off Highway Vehicle (OHV) use such as motorized dirtbikes and "quads," design features will be implemented to minimize potential OHV use. As is mentioned in Chapter 2 of the EIS, "firelines should be constructed in a manner to conceal their location as much as practical and should be covered with native material within a month after the prescribed fire is declared out (provided that the area is accessible at that time). From existing OHV points of access (i.e. roads, campgrounds, campsites, etc…), fireline concealment of view should occur. Additionally, if vegetation is cut and removed along the fireline, portions of the fireline that are close to access points will retain vegetation at a spacing of less than 4 feet. Monitoring will be conducted to determine illegal OHV use. If illegal OHV use is discovered, public service staff will employ additional techniques to block or discourage OHV use" (Design feature REC-3)

Within the IRA, up to 16,122 acres will receive burning only. Burning will consist of broadcast burning or underburning. Burning would take place over a period of 7 to 10 years and the acres burned in any given year are limited by project design features. Note that the 28 acres of thin/prune/pile will include pile burning and/or underburning, which means that the entire 16,150 acre IRA is authorized to be burned under Alternative 2 of the Green Horse Project.

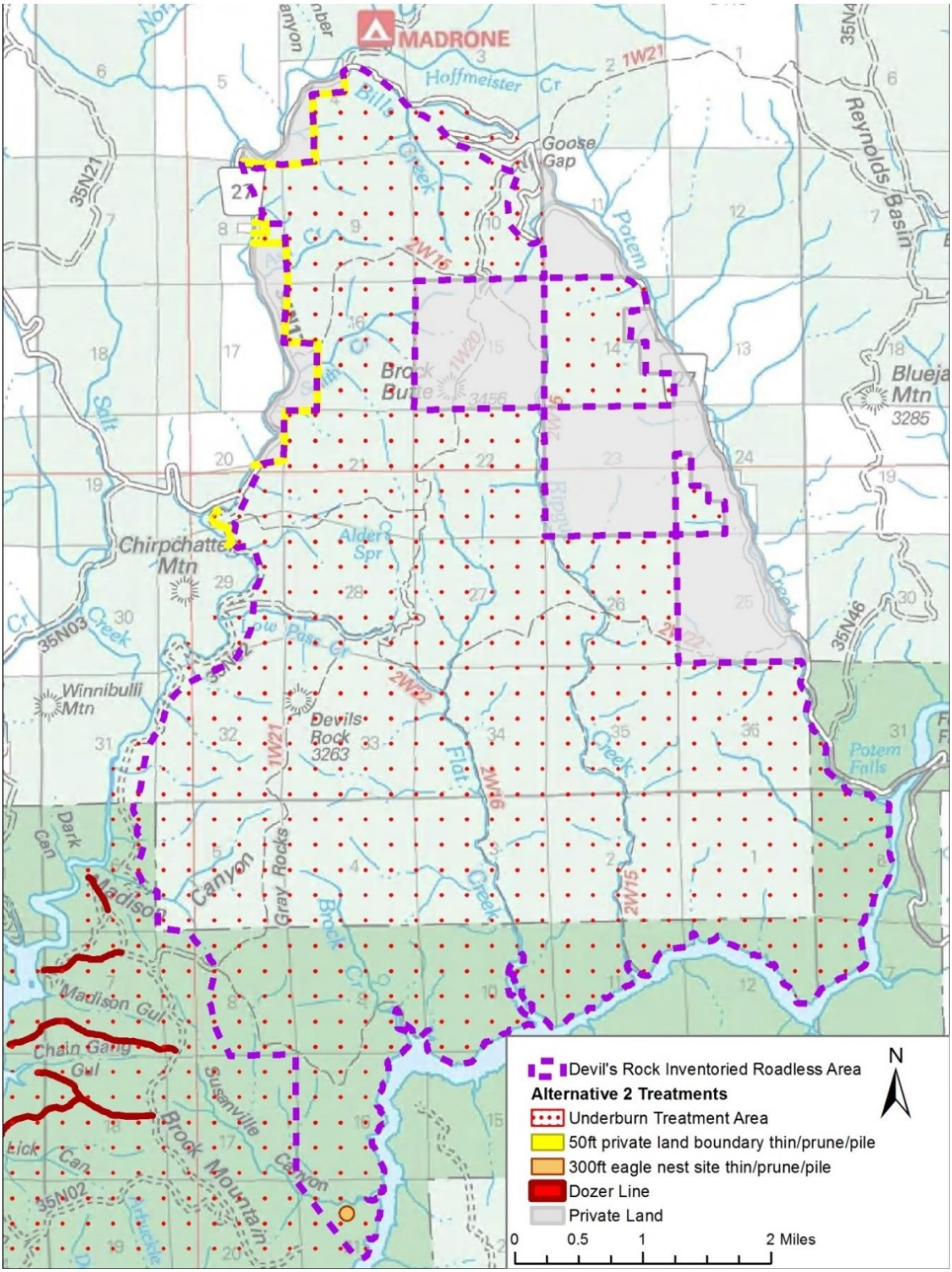

Figure 1: Alternative 2 Treatments within Devil's Rock IRA.

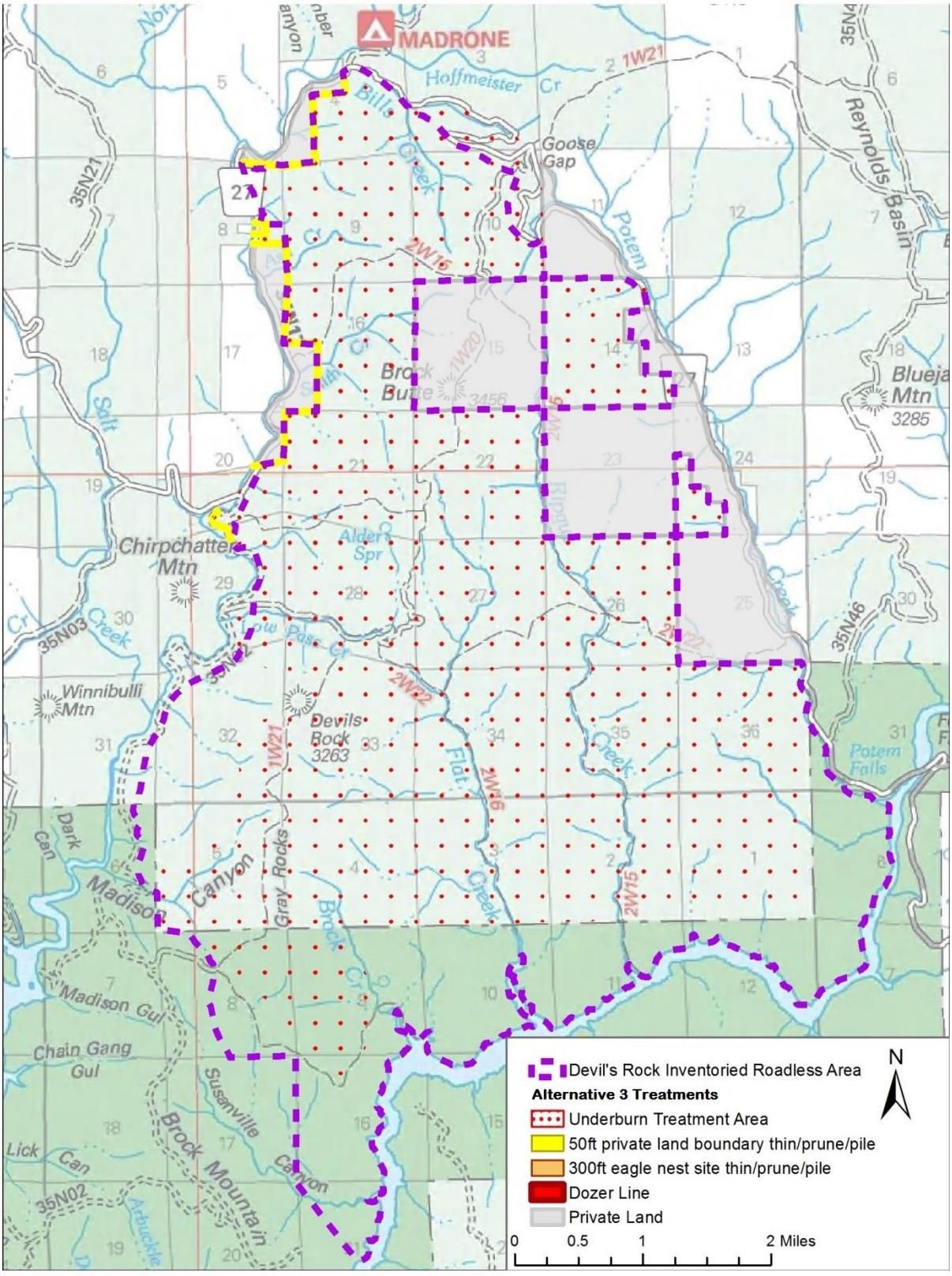

Figure 2: Alternative 3 Treatments within Devil's Rock IRA

1.3 Activities Proposed within the IRA under Alternative 3

Within the IRA, 22 acres of the IRA along private property boundary will receive the thin/prune/pile treatment (See Figure 2). This treatment will only occur within a 50 foot buffer along private property boundaries in the northwest portion of the IRA. Where this occurs, the private property boundary is also the IRA boundary, so these 22 acres of thin/prune/pile will occur on the outermost 50 feet of the IRA.

No broadcast burning or underburning is being proposed in the vicinity of the one known bald eagle nest site, so thin/prune/pile around that bald eagle nest site would not occur. However, if, during implementation, bald eagles create any new nest sites in the portion of the IRA proposed for burning, thin/prune/pile will occur within 300 feet of those new nest sites.

As with alternative 2, there will be no dozer line construction. Some handline construction may occur around private property, newly discovered bald eagle nest sites, and around certain sensitive environmental or cultural resources that require protection from fire. Design feature REC-3 would apply to all handline.

Burning only will occur on up to 12,822 acres. Together with the 22 acres of thin/prune/pile that will also be pile burned and/or underburned, a maximum of 12,844 acres will be burned under Alternative 3.

2. COMPLIANCE WITH 2001 ROADLESS RULE

2.1 Analysis of Green Horse Treatments

An important concern of this project is whether the Green Horse Project complies with the 2001 Roadless Rule. The 2001 Roadless Rule prohibits road construction and reconstruction in IRAs except under limited circumstances (2001 Roadless Rule § 294.12). A road is defined as a "motor vehicle travelway over 50 inches wide, unless designated and managed as a trail." (2001 Roadless Rule § 294.11). No roads would be constructed or reconstructed as part of the Green Horse Project under any alternative. Any handlines that are constructed would be less than 50 inches wide. No motor vehicles would travel on the handlines as part of the project and no motor vehicle use would be authorized on handlines. Further, any handlines that are created will be concealed after use in order to reduce the chance that they are used by motor vehicles (Design Feature REC-3). No dozer line would be constructed in the Devil's Rock IRA. As a result, the Green Horse project complies with the prohibition on Road Construction and Reconstruction in IRAs.

The 2001 Roadless Rule also prohibits timber cutting, sale, or removal in inventoried roadless areas except under limited circumstances. One of those exceptions is as follows:

- The cutting, sale, or removal of generally small diameter timber is needed for one of the following purposes and will maintain or improve one or more of the roadless area characteristics as defined in § 294.11.
- To improve threatened, endangered, proposed, or sensitive species habitat; or
- To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period; (2001 Roadless Rule § 294.13(b)(1)).

The preamble to the 2001 Roadless Rule explains further, "areas that have become overgrown with shrubs and smaller diameter trees creating a fuel profile that acts as a ''fire ladder'' to the crowns of the dominant overstory trees may benefit ecologically from thinning treatments that cut and remove such vegetation. The risk of uncharacteristic fire intensity and spread may thus be reduced, provided the excess ladder fuels and unutilized coarse and fine fuels created by logging are removed from the site. Also, in some situations, cutting or removal of small diameter timber may be needed for recovery or conservation of threatened, endangered, proposed or sensitive species to improve stand structure or reduce encroachment into meadows or other natural openings" (2001 Roadless Rule, p. 3257).

Another exception to the prohibition on timber cutting, sale, or removal in IRAs is:

- The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited by this subpart. (2001 Roadless Rule § 294.13(b)(2)).

The 2001 Roadless Rule Preamble provides examples of incidental activities: "Examples of these activities include, but are not limited to trail construction or maintenance; removal of hazard trees adjacent to classified roads for public health and safety reasons; fire line construction for wildland fire suppression or control of prescribed fire; survey and maintenance of property boundaries; other authorized activities such as ski runs and utility corridors; or for road construction and reconstruction where allowed by this rule." (2001 Roadless Rule, p. 3258).

As part of the Green Horse Project, conifers of up to 8 inches and hardwoods of up to 4 inches DBH will be cut as part of the thin/prune/pile treatments to protect bald eagle nest sites and private property from prescribed fire. Thinning within 50 feet of private property boundaries will reduce the risk that prescribed fire will spread onto private land and will allow fire managers to ignite untreated forest in places more than 50 feet from private property boundaries. In other words, the thinning will facilitate the burning. Further, the area along private property boundaries that will be thinned is tiny (22 acres under alternatives 2 and 3) when compared to the area that will only be burned (16,122 acres in alternative 2 and 12,844 acres in alternative 3). Just as fire line construction for control of prescribed fire is classified as incidental to the prescribed fire, thinning along private property boundaries in the Green Horse Project is also incidental to the prescribed fire.

The 22 acres of thin/prune/pile that is proposed along private property boundaries also meets the ecosystem restoration exception for tree cutting as defined in the 2001 Roadless Rule at section 293.13(b)(1) (2001). Thinning would only cut small diameter timber since only trees less than 8" DBH (or 4" DBH for hardwoods) will be cut. Thinning of these smaller trees will reduce fuel ladders or "fire ladders" along private property boundaries which will reduce the risk of uncharacteristic fire effects within the area that is thinned. As is discussed below, thinning is expected to have negligible or no direct effects to several of the roadless area characteristics. Most importantly, thin/prune/pile would improve several of the roadless area characteristics by reducing the risk of high severity fire within the area that is treated by thin/prune/pile as well as within the area immediately adjacent to the thin/prune/pile area that otherwise could not be burned because it is too close to private property.

The thinning that would occur around bald eagle nest sites would also meet the habitat improvement exception in section 293.13(b)(1). Again, only small diameter trees would be cut. The thinning itself will be performed specifically to benefit the bald eagle, a forest service sensitive species, by preventing the nest trees from burning up, both from prescribed fire and future natural fires that will occur in the area after thinning is completed. Finally, this thinning will maintain or improve several of the roadless area characteristics. Given the limited extent of the thinning, thinning will not impair any of the roadless area characteristics when the IRA is considered as a whole. At least one roadless area characteristic, "Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species

dependent on large, undisturbed areas of land," will be improved.

In conclusion, all of the activities proposed within the Devil's Rock IRA under Alternatives 2 and 3 are permitted under the 2001 Roadless Rule. Trees cut as part of the thin/prune/pile treatment along private land satisfy the incidental exception of section 294.13(b)(2) as well as the ecosystem restoration exception of section 294.13(b)(1)(ii). Trees cut as part of the thin/prune/pile treatment around bald eagle nest sites satisfy the sensitive species habitat improvement exception under section 294.13(b)(1)(ii).[2] No roads will be constructed or reconstructed, and any handline that is constructed will neither be managed as a road nor function as a road. Finally, the main activity proposed for the Devil's Rock IRA is prescribed fire, which is not prohibited in under the 2001 Roadless Rule and, as is described in the following section, will improve roadless area characteristics throughout the IRA.

2.2 USDA Forest Service Internal Review

A briefing paper describing activities within the IRA boundary was prepared and shared with the USDA Forest Service's Regional Office in Vallejo, CA (Region 5). The briefing was sent to the Regional Forester's representative on August 6, 2015. On August 12, 2015, the deputy regional forester issued a determination that the Green Horse Project:

- Is consistent with the 2001 Roadless Rule,
- Will protect roadless characteristics, and
- Does not need to be reviewed by the Forest Service's national headquarters.

A copy of the regional forester's letter and the briefing document is included in Appendix A of this report.

3. PROJECT EFFECTS TO ROADLESS AREA CHARACTERISTICS

A brief summary of effects to roadless area characteristics can be found in Table 1. The sections below explain the general effects of the project on the roadless characteristics found in the Devil's Rock IRA. In addition, a more complete analysis regarding many of the roadless characteristics can be found in other specialist reports.

3.1 High Quality or Undisturbed Soil, Water, and Air

This element of roadless character is defined in the preamble to the 2001 Roadless Rule as follows: "These three key resources are the foundation upon which other resource values and outputs depend. Healthy watersheds catch, store, and safely release water over time, protecting downstream communities from flooding; providing clean water for domestic, agricultural and industrial uses: helping maintain abundant and healthy fish and wildlife populations; and are the basis for many forms of outdoor recreation." 2001 Roadless Rule, p. 3245. In addition to the analysis below, more information can be found in the Soils, Geology, and Hydrology Report as well as the Fire, Fuels and Air Quality Report.

[2] Additionally, any trees cut along handline, would satisfy the incidental exception to tree cutting as is specifically mentioned in the preamble to the 2001 Roadless Rule on 66 Fed. Reg. 3258 (Jan 12, 2001).

3.1.1 Alternative 1

There will be no direct effects to air quality as no activities will occur.

The indirect effects of failing to burn would allow the current risk of large-scale, high severity fire to persist and, with continued fire suppression, would increase over time. A large-scale, high severity fire would likely result in levels of pollutants that exceed California Air Resource Board (CARB) air quality standards. A large-scale, high severity fire would impact the soil resource due to gullying, debris flows, and small landslides. A large-scale, high severity fire would harm water quality by increasing the level of suspended sediment in streams flowing through the IRA.

3.1.2 Alternative 2

Regarding air quality, prescribed fire within the IRA will lead to a short term reduction in air quality; however, by implementing the project over several years and during favorable air conditions, air pollution levels will not violate Federal, State or County air quality laws and regulations. In the middle to long term, reduced fuels on the landscape would lead to lower emissions to the atmosphere during a future wildfire that are less likely to exceed Air Quality standards.

Since the direct impacts of prescribed fire will have a relatively short-term impact on air quality (lasting for only a few days in the atmosphere at most) the timing of ignition will ensure that adverse cumulative effects of the project on air quality are essentially eliminated. For example, compliance with CARB standards ensures that prescribed fire under this project will not be ignited when air quality is already poor. Similarly, compliance with CARB standards will prevent multiple prescribed fires from being ignited at the same time if those two fires, cumulatively, will adversely impact air quality. Finally, prescribed fire will be ignited when the risk of wildfire is low and when weather conditions allow for fast dispersal of pollutants. As a result, it is extremely unlikely that air pollutants from this prescribed fire will accumulate with pollutants from a future (unpermitted) wildfire.

Regarding soil quality, given the low intensity of prescribed fire, erosion is predicted to be minimal. Hand pile burning would result in soil heating under the burned piles. At the same time, combustion of organic matter would likely enhance soil development and fertility through the release of nutrients. The impacted areas would be minimal in extent and the effects would not be detrimental to soil properties on the greater landscape. In the longer term, by reducing fuel levels, the risk of large-scale high-intensity wildfires would decrease, reducing the risk of severe erosion, soil sterilization, and hydrophobicity.

Regarding water quality, prescribed fire would likely deliver a small amount of sediment to streams, but the increase would not cause downstream impacts to beneficial uses. When resource protection measures are applied, thinning and handline construction result also result in minimal sediment delivery. In the middle to long term, the decreased risk of large-scale, high-severity fire would reduce the likelihood that severe sediment delivery would occur. Shade trees along streams would be more likely to survive a future fire and, as a result, temperatures and flow rates of these streams would continue to be moderated.

3.1.3 Alternative 3

Under alternative 3, prescribed fire within the IRA will be reduced by approximately 20% and thin/prune/pile treatments will be reduced by 25% compared to alternative 2. As a result, effects to these roadless characteristics under alternative 3 will be nearly the same as those under alternative 2 but smaller in magnitude.

3.2 Sources of Public Drinking Water

This element of roadless character is defined in the preamble to the roadless rule as follows: "Maintaining [watersheds contributing to drinking water] in a relatively undisturbed condition saves downstream water filtration costs. Careful management of these watersheds is crucial in maintaining the flow and affordability of clean water to a growing population." 2001 Roadless Rule, p. 3245.

All water that flows through the Devil's Rock IRA ends up in Shasta Lake. Shasta Lake is a source of public drinking water. Activities proposed within the IRA are expected to create a minimal increase in sediment levels; however, once this sediment reaches Shasta Lake, it will drop out of the water column and have no effect on water quality. Any increase in undesirable dissolved solids will be diluted by the sheer volume of Shasta Lake and have no effect on water quality.

In addition to Shasta Lake, there is some private property along the northeastern and northwestern boundary of the IRA including a few private residences along Squaw Creek (Forest Road 34N17 is in the same area). However, according to the State of California's Electronic Water Rights Information Management System, there are no privately held water rights for surface water on any of the streams that flow out of the Devil's Rock IRA (California EPA State Water Resources Control Board 2015). Similarly, there are no privately held water rights downstream of the IRA along Squaw Creek, Potem Creek, or the Pit River. Note that Squaw Creek and the Pit River flow directly into Shasta Lake and Potem Creek flows into the Pit River.

The lack of private water rights in these areas means that all residents downstream from the IRA either withdraw their water from Shasta Lake or from private wells, which are groundwater sources that are not tracked as water rights.

Since wells arise from groundwater, the water source will be protected from any increased sediment created by project activities. Similarly, dissolved solids will either be filtered out or seriously diluted once they reach the groundwater source where residents withdraw their water.

3.3 Diversity of Plant and Animal Communities

This element of roadless character is defined in the preamble to the roadless rule as follows: "Roadless areas are more likely than roaded areas to support greater ecosystem health, including the diversity of native and desired nonnative plant and animal communities due to the absence of disturbances caused by roads and accompanying activities. Inventoried roadless areas also conserve native biodiversity by serving as a bulwark against the spread of nonnative invasive species." 2001 Roadless Rule, p. 3245. This section deals with diversity of all native plants and animals within the IRA. In addition to the analysis below, more information can be found in the Invasive Species Report. Effects to rare species such as threatened, endangered, and sensitive species are addressed in the next section.

Botanical and wildlife diversity depends on habitat diversity. Within the project area, age and size-class diversity of trees within forest stands is a major factor that controls habitat diversity. Due to decades of fire suppression, there is currently a lack of age and size class diversity within stands and between stands. Regarding between-stand diversity, currently only about 2,000 acres of the 38,000 acres of forest habitat (5%) meet the definition of early successional (early seral or young stands) (Newburn and Payne 2014, Table 18). Age and size class diversity within stands (stand structural diversity) can be created by crown fire, which kills overstory trees. When larger patches of vegetation burn under a crown fire, the forest is turned into early successional habitat, creating diversity between stands. A moderate amount of crown fire thus improves diversity; however, once the extent of the crown fire exceeds a certain area, early successional habitat becomes the dominant vegetation type and diversity is not improved because late successional species are simply replaced with early successional species. Additionally, on the STNF, the area of late-successional habitat needed to support late-successional wildlife species tends to

be larger than the area of early-successional habitat needed to support early-successional wildlife species. As a result, an equal distribution of seral stages is not ideal.

As the roadless rule explains, non-native invasive species (noxious weeds) are another threat to diversity. Such species tend to thrive in open areas such as areas where the canopy has been removed due to crown fire. Areas with disturbed soil such as dozer line (and, to a lesser extent, hand line) provide habitat for noxious weeds. Burn piles may also create suitable habitat for noxious weeds. Finally, firelines (dozer lines and handlines) also create a conduit through which invasive weeds can spread into an area from the outside.

3.3.1 Alternative 1

Under Alternative 1 (no action) there would be no direct effects to plant and animal diversity. However, the indirect effect of no action is that a wildfire burning under 90% percentile weather conditions would be severe. Such a fire would burn as passive crown fire (torching individual trees) across 6% of the project area and would burn as active crown fire (fire that spreads from one tree crown to another) across 63% of the project area (Newburn and Payne 2014, Table 7). Thus, nearly two thirds of the project area would be early successional habitat and the remaining one third would be split up among other age classes. Such a result is not likely to improve plant and animal diversity in the long term, especially since wildlife species on the STNF that rely on late successional forest often require large areas of late successional habitat.

After such a wildfire, the large areas lacking a tree canopy would be excellent habitat for noxious weeds. Additionally, the fire line that would likely be constructed to control a future wildfire in the IRA would facilitate noxious weed colonization and spread.

3.3.2 Alternative 2

Under Alternative 2, the prescribed fire treatment is anticipated to burn as passive crown fire across 9% of the project area but none of the project area would experience active crown fire as a result of the prescribed fire (Newburn and Payne 2014, Table 8). Thus, the direct effect of alternative 2 is the creation age- and size-class diversity within 9% of the stands across the project area. The indirect effect of alternative 2 is that a future wildfire (modeled under 90% weather conditions) would have fire severity greatly reduced. Such a wildfire would only burn as passive crown fire across 8% of the project area and as active crown fire across 4% of the project area. The cumulative effects of alternative 2, then, when combined with a future wildfire, would be that more structurally diverse stands would cover 17% of the project area and 4% of the project area would consist of new early successional habitat. Such an end result would increase plant and animal diversity over current levels by increasing early successional habitat without drastically decreasing late successional habitat.

Although the burn piles that will be ignited under alternative 2 may create suitable habitat for noxious weeds; the limited extent of this proposed treatment would render this effect minor. Also, design feature WEED-3 provides that burn piles would not be created within 100 feet of invasive plant populations. Further, the burn piles established along private property will be placed in the outer 50 feet of the IRA, so the piles would not serve as a conduit to introduce invasive plants into the core of the IRA.

Hand lines could create a conduit for establishment of noxious weeds within the project area; however, design feature WEED-3 provides that hand lines would not be created within 100 feet of known invasive plant populations. Also hand tools and chainsaws will be cleaned before use to reduce the introduction of invasive plant seeds.

More importantly, while the construction of hand lines does create some risk of invasive plant

colonization, the prescribed fire would reduce the intensity and rate of spread of future wildfire. Such a future wildfire would likely require fewer miles of fireline (and less opportunity for invasive plant colonization) to suppress the fire than would be required to suppress a wildfire that would burn under the no-action alternative.

3.3.3 Alternative 3

Under Alternative 3, due to the decreased area of treatment, the prescribed fire is anticipated to burn as passive crown fire across 1% of the project area but none of the project area would experience active crown fire (Newburn and Payne 2014, Table 9). The direct effect of alternative 3 would be a slight improvement in the amount of improved structural diversity across 1% of the project area. The indirect effect of alternative 3 is that a future wildfire (modeled under 90% weather conditions) would have fire severity somewhat reduced. Such a wildfire would burn as passive crown fire over 5% of the project area and as active crown fire across 44% of the project area. The cumulative effects of alternative 3, then, when combined with a future wildfire, would be that more structurally diverse stands would cover 6% of the project area and 44% of the project area would consist of new early successional habitat. Thus, nearly half of the project area would be in early successional habitat and the other half would be split among the other age classes. Such a result, while less extreme than that of alternative 1, is not likely to improve plant and animal diversity in the long term, especially since wildlife species that rely on late successional forest often require large areas of late successional habitat.

Burn piles and handlines established under alternative 3 would create minor opportunities for colonization and spread, but those opportunities would be more limited than those under alternative 2. On the other hand, future wildfires are predicted to be more intense under alternative 3 than under alternative 2. The extent of the firelines (and opportunity for invasive plant colonization) required to suppress a future wildfire under alternative 3 would therefore be greater than that of a wildfire under alternative 2 but less than that of a wildfire under alternative 1.

3.4 Habitat for Threatened, Endangered, Proposed, Candidate, and Sensitive Species and for Those Species Dependent on Large, Undisturbed Areas of Land

The preamble to the 2001 Roadless Rule explains, "Roadless areas function as biological strong holds and refuges for many species. Roadless areas support a diversity of aquatic habitats and communities, providing or affecting habitat for more than 280 TES species." 2001 Roadless Rule, p. 3245. In addition to the analysis below, more information can be found in the Botany Biological Evalutaion (Botany BE), the Wildlife Biological Assessment (Wildlife BA), Wildlife BE, and the Fisheries BA/BE.

No listed Endangered or Threatened plants or fungi and no plant or fungi species proposed for federal listing are known or suspected to occur on the Shasta-Trinity National Forest. Eleven Sensitive plant and fungi species are either known to occur within the project area or have suitable habitat within the project area.

Regarding Threatened and Endangered animals, a single gray wolf (OR-7) was detected in northern California in 2011 but has since returned to Oregon. The wolf did not enter the Green Horse Project Area. There is no scientific evidence that wolves have occurred within the analysis area for over 100 years. OR-7 is currently hundreds of miles from the analysis area and is unlikely to return to California now that he has found a mate and established a pack in Oregon.

The only federally listed species that may occur in the project area is the Northern Spotted Owl (a threatened species). The Green Horse project area was divided into two subsections regarding NSO

habitat. The Devil's Rock IRA falls within Subsection B, where there is potential suitable nesting/roosting and foraging habitat (Johnson 2014). Subsection B contains the only habitat with any likelihood of use by NSO for nesting/roosting or foraging, though the likelihood is still fairly low. The relatively small amount of the nesting/roosting habitat referenced above is scattered across Subsection B and does not represent a contiguous block of habitat; the largest block of 76 acres is separated by approximately 0.25 mile from the next largest block of 33 acres. This wide dispersal of available habitat reduces the likelihood that it would be occupied.

Also contributing to the lack of suitability of the project area for NSO, the ambient temperatures are significantly higher in this area relative to the temperature range where NSO would normally occur.

The project area contains habitat for twenty two Sensitive terrestrial animal species. Of these, there are currently 35 bald eagle nesting territories including one territory within the IRA. Nest trees are generally large-limbed, mature overstory conifers (generally pine) located within close proximity (2 miles or less) to large bodies of water that provide fish and waterfowl for foraging (Johnson 2012, p. 31). Another sensitive species of note is the fisher, which is currently proposed for federal listing under the Endangered Species Act. The fisher is a predator with a broad diet that tends to prefer late successional forest (especially for resting and denning) and can occupy a large home range of up to 11,000 acres in low quality habitat (Johnson 2012, p. 36). Two fishers were sighted in the project area in 2004 and a 2007 survey resulted in multiple sightings around Shasta Lake, although none in the project area. One more important Sensitive species is the Shasta Salamander. Locally endemic to Shasta County, it is found within the Devil's Rock IRA. (Johnson 2012, p. 34; USDA Forest Service 1994a, p. C-10). The Shasta salamander primarily inhabits limestone formations in the Shasta Lake area and the slopes adjacent to these areas. A recent survey found that it may also inhabit non-limestone habitats near the McCloud Reservoir, though these occurrences are not common Johnson 2012).

The project area lies outside of the range of federally listed Threatened, Endangered or Proposed aquatic species and their habitats; however, the project area contains habitat for five Sensitive aquatic animal species and occupancy of the project area by these species is presumed.

3.4.1 Alternative 1

There will be no direct effects to any Threatened or Sensitive species under the no-action alternative.

The indirect effects of failing to burn would allow the current risk of large-scale, high severity fire to persist and, with continued fire suppression, would increase over time. Such a fire is predicted to burn as active crown fire across 63% of the project area and would result in a moderate long-term adverse indirect effect to at least six Sensitive plant and fungi species (*Boletus pulcherrimus*, *Cypripedium fasciculatum*, *Cypripedium montanum*, *Mielichhoferia elongata*, *Neviusia cliftonii*, and *Phaeocollybia olivacea*) but might be beneficial to the other five Sensitive plant and fungi species (*Clarkia borealis ssp. borealis*, *Eriastrum tracyi*, *Fritillaria eastwoodiae*, *Lewisia cantelovii*, or *Sedum obtusatum ssp. paradisum*) due to the opening up of the forest canopy.

Regarding the Threatened Northern Spotted Owl (NSO), a future high-intensity fire would likely result in the loss of what habitat elements for NSO do occur in Subsection B of the project area. The overall effect to NSO, however, would be negligible, given the low probability for NSO occurrence within the project area.

Regarding the bald eagle, which is associated with the shoreline of Shasta Lake, the risk of habitat loss from high intensity wildfire would continue to increase in the Shasta Lake area within the project area (due to continuing vegetation growth and fire suppression), particularly during periods of high recreational use, such as spring break, Memorial Day, Fourth of July, and Labor Day holidays. During

these periods, the increased risk of human-caused fire, combined with high human use of areas in close proximity to eagle nest trees (i.e. the lake shoreline), puts timportant eagle nesting habitat elements at very high risk of loss from high intensity wildfire. This risk is increased further where large accumulations of fuel are present in close proximity to current and potential future nest trees.

A future high severity fire could also harm the fisher by eliminating some of the late successional forest and killing many of the large trees on which it relies.

High intensity wildfire could harm some Shasta salamander individuals although the lower fuel levels found within the limestone outcrops (where the salamander is most common) would likely cause the level of harm to be small.

An analysis of effects to the other sensitive terrestrial species can be found in the Wildlife BE for the project.

Indirect effects of the no-action alternative to Sensitive aquatic species are expected to be negative. Because no treatment would occur in Riparian Reserves, existing dense vegetation conditions would persist and would be expected to become denser, which would leave these areas susceptible to the effects of a future high-severity wildfire. Widespread removal of riparian vegetation from a high-severity fire would increase sediment delivery to aquatic habitats and negatively affect aquatic species by increasing water temperatures due to loss of riparian shade, reducing pool quality, and decreasing in the quality of instream habitat features such as pools and spawning gravels. Channel maintenance processes would be disrupted for several years following the fire.

3.4.2 Alternative 2

The Sensitive plant and animal species within the project area have evolved and existed in a fire-dependent ecosystem; therefore, they may be expected to survive or respond positively to low- or moderate-intensity fire.

Prescribed fire can be expected to cause some direct mortality to plants but the surviving individuals would benefit from increased nutrients and light. Pile burning also have a negative effect to Sensitive plant and fungi species given the higher soil temperatures experienced under piles; however, design features that exclude pile burning from riparian areas and the small extent of pile burning is expected to keep these effects negligible and short-term. Hand thinning and pruning will similarly have little to no effect on known occurrences of Sensitive plant and fungi species given project design features. In short, implementation of Alternative 2 may impact, but is not likely to lead to a trend toward Federal listing or loss of viability for the eleven Forest Service Sensitive plant and fungi species analyzed.

In the longer term, the reduction in intensity of a future wildfire would be expected to benefit at least six Sensitive plant and fungi species (*Boletus pulcherrimus*, *Cypripedium fasciculatum*, *Cypripedium montanum*, *Mielichhoferia elongata*, *Neviusia cliftonii*, and *Phaeocollybia olivacea*). Since such a future wildfire is still predicted to create openings across 21% of the landscape, the long term effects of Alternative 2 to the other five Sensitive plant and fungi species (*Clarkia borealis ssp. borealis*, *Eriastrum tracyi*, *Fritillaria eastwoodiae*, *Lewisia cantelovii*, or *Sedum obtusatum ssp. paradisum*) are not predicted to be negative.

Given the lack of any evidence that gray wolves inhabit the area the proposed project will have no effect to the gray wolf.

Regarding the Threatened Northern Spotted Owl, some elements of currently potentially suitable habitat may be altered if understory components are removed by prescribed fire, which may result in some

short term impacts to the forest structure. The predicted mostly low- to moderate-intensity prescribed fire would maintain habitat function in the short term while improving the potential long-term suitability and resiliency. The proposed project activities would not remove or downgrade any NSO nesting/roosting or foraging habitat.

Additionally, the proposed treatments are unlikely to negatively impact any NSO that may occur in the analysis area through impacts to its prey. Only a small portion of the project area will be burned in any given year and, even within the burned area, pockets of unburned understory will remain. As a result, Implementation of the project within Subsection B (which includes the Devil's Rock IRA) may affect, but is not likely to adversely affect NSO.

Alternative 2 would be expected to have long-term beneficial effects to the NSO habitat elements that do occur in the analysis area as the forest becomes more fire resilient, fire return intervals more closely approximate historic patterns and fire is allowed to play a more natural role in ecosystem processes.

No direct effects to the bald eagle are expected from the proposed activities because project design features would preclude disturbances during critical periods of bald eagle breeding season and when young are not mobile enough to readily move from a disturbance. Thinning around bald eagle nest trees will reduce the risk that those trees will be killed as a result of future high-intensity wildfire.

Regarding the fisher, the proposed activities are not likely to negatively impact currently intact suitable habitat for fisher because fire intensity during project implementation is predicted to be low. Some elements of currently suitable habitat may be altered if understory components are removed by fire, which may result in some short term impacts to the forest structure. However, in the longer term, this alternative would have a beneficial impact by reducing the susceptibility of suitable habitat to loss from a future wildfire.

Direct effects to Shasta salamanders are unlikely to occur due to the requirement of a 300 foot buffer from limestone habitats for all activities that may directly or indirectly affect Shasta salamanders or their important habitat elements. Because of the very low density of individuals within non-limestone areas, project implementation is unlikely to affect populations. The reduced risk of high intensity fire would likely provide some protection to salamander habitat in the future.

Regarding the other sensitive terrestrial wildlife species, project activities under alternative 2 may affect individuals but measurable or meaningful impacts to the species are not expected. See the Wildlife BE for more information.

Regarding aquatic species, alternative 2 may impact individuals but would not cause a trend towards federal listing or a loss of viability for the five sensitive aquatic species presumed to inhabit the project area. Activities proposed under the alternative 2 would have an overall neutral effect on aquatic habitat indicators. These actions are not expected to introduce measurable instream fine sediment into perennial stream reaches where aquatic species of concern occur. Baseline conditions for all instream habitat elements would be maintained. The long-term trend would be a slight improvement in overall riparian and aquatic conditions in the analysis area because of the reduced threat of high severity wildfire in the watersheds. The proposed treatments would reduce the severity of effects to aquatic habitats from a future wildfire and would result in reduced future cumulative effects from potential high severity fires.

3.4.2 Alternative 3

Under Alternative 3, treatments will be less extensive than Alternative 2 and, as a result direct impacts to Sensitive species and the NSO (the only Threatened species that could occur within the project area) will be smaller. Indirect effects, specifically the reduction in the amount of habitat loss expected to

result from a severe wildfire, will also be smaller under Alternative 3 than alternative 2. In other words, for species which are harmed by severe wildfire Alternative 3 is expected to have a smaller positive indirect effect than Alternative 2.

Regarding the bald eagle, no thinning would occur around the one known nest tree within the IRA, so, as long as no new nest trees are discovered within the treatment area, the direct and indirect effects to the bald eagle within the IRA would be the same under Alternative 3 as under the no-action alternative (Alternative 1). On the other hand, if a new bald eagle nest tree is created or discovered within the area that will be burned under Alternative 3, the area around that tree will be thinned, and will provide the same benefits to that tree as would be provided under Alternative 2.

3.5 Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized Classes of Dispersed Recreation

The Preamble to the 2001 Roadless Rule Explains, "Roadless areas often provide outstanding dispersed recreation opportunities such as hiking, camping, picnicking, wildlife viewing, hunting, fishing, cross-country skiing and canoeing. These areas can also take pressure off heavily used wilderness areas by providing solitude and quiet, and dispersed recreation opportunities." 2001 Roadless Rule, p. 3245.

The terms "Primitive," "Semi-Primitive Non-Motorized," and "Semi-Primitive Motorized" refer to three classes of "setting" that are identified under the Recreation Opportunity Spectrum. The Recreation Opportunity Spectrum (ROS) defines a setting as a combination of physical, biological, social, and managerial conditions that give value to a place. The ROS assumes that recreationists seek a diversity of recreational opportunities from the highly constructed and interactive to the natural and solitude-oriented (Newburn 2012, p. 9). While ROS classes function as a system of for classifying conditions on the ground, they are also used as a way to establish management goals for different areas of land. The Shasta-Trinity National Forest LRMP has allocated National Forest System lands to five of the six ROS classes:

1. **Primitive (P):** Characterized by essentially unmodified natural environments with size and configuration assuring remoteness from the sights and sounds of human activity.
2. **Semi-Primitive Non-motorized (SPNM):** Characterized by predominantly natural or natural appearing landscapes and the absence of motorized vehicles. The size gives a strong feeling of remoteness. The presence of roads is tolerated, provided they are closed to public use, used infrequently for resource protection and management and road standards are visually appropriate.
3. **Semi-Primitive Motorized (SPM):** Characterized by predominantly natural or natural appearing landscapes and the presence of motorized vehicles. The size gives a strong feeling of remoteness.
4. **Roaded Natural (RN):** Characterized by predominantly natural-appearing settings with moderate sights and sounds of human activities and structures.
5. **Rural (R):** The sights and sounds of human activity are readily evident while the landscape is often dominated by human-caused geometric pattern (Newburn 2012, p. 9).

A final ROS class of "Urban" is characterized by even more evidence of human activity and management than the Rural class, but no areas on the forest have been assigned ROS class "U."

In addition to the general descriptions of ROS classes, the ROS system utilizes seven indicators to ensure consistent and appropriate management of the various classes. These indicators are

A. Access
B. Remoteness
C. Naturalness [relating to the appearance of naturalness]
D. Facility and Site Management
E. Social Encounters
F. Visitor Impacts
G. Visitor Management (USDA Forest Service 1990)

An area assigned to an ROS class on the "primitive" end of the spectrum is managed for low levels of access, high levels of remoteness and naturalness, rudimentary site management, few social encounters, and low levels of both visitor impacts and visitor management. An area managed for rural recreational opportunities would allow high levels of access, a low sense of remoteness and natural appearance, complex facilities, frequent social encounters, and high levels of both visitor impacts and visitor management. Note the more developed ROS classes are not required to have higher levels of development and interactivity but less developed ROS classes are required to have lower levels of development and interactivity. For example, it is acceptable to have areas with no access or natural appearing landscapes in a RN but it is not acceptable to have a four-lane highway or a large group camping event in a SPNM setting.

For each of the seven indicators, guidelines have been established that set the limits of acceptable change to maintain the integrity of the setting. The guidelines identify on-the-ground conditions that are likely to affect the indicator. These conditions are classified as follows based on how they impact the setting indicators:

Fully Compatible:	Conditions that meet or exceed the norm
Norm:	Normal conditions found in the setting
Inconsistent:	Conditions that are not generally compatible with the norm, but may be necessary under some circumstances to meet the management objective
Unacceptable:	Unacceptable conditions under any circumstances for a given setting

Certain situations may require localized adaptations. These adaptations represent setting inconsistencies identifying conditions outside the normal range for a setting, but may be appropriate under some circumstances. Inconsistencies can occur when the conditions for an indicator are temporarily or permanently changed through the process of meeting an integrated set of resource management objectives. Where this is necessary, managers must support their decision to deviate from these indicator guidelines (USDA Forest Service 1987).

The Devil's Rock IRA contains portions designated as SPNM, SPM, RN, and R. No areas within the IRA (or the rest of the project area) are designated P. Since the 2001 Roadless Rule determined that P, SPNM, and SPM are the classes of dispersed recreation relevant to Roadless Area Values, this analysis will consider the effects of the Green Horse project on SPNM and SPM classes of dispersed recreation within the IRA. The key question is whether treatments under the Green Horse Project would create conditions that are inconsistent or unacceptable in Semi Primitive Non-Motorized and Semi-Primitive Motorized settings.

This analysis will consider six of the seven ROS setting indicators. The Facility and Site Management

indicator will not be considered because it is inapplicable to the Green Horse Project and Devil's Rock IRA. There are no facilities or recreation sites within the IRA and the Green Horse Project does not propose to create any new facilities or recreation sites within the IRA.

Regarding the Access setting indicator, the relevant conditions relate to the type of trails or roads within an area. Non-motorized trails are the Norm in SPNM settings and Fully Compatible with SPM settings.

Regarding the Remoteness setting indicator, the relevant conditions relate to sights and sounds of human activities as well as the distance to roads and travelways. For both SPNM and SPM settings, the Norm is that sights and sounds of human activities will be distant. SPNM is can be expected to be more than ½ hour walk from a primitive road (closer would be considered inconsistent with SPNM) while SPM may be closer than ½ mile walk from a primitive road.

The Naturalness setting indicator is analyzed by determining whether a particular management activity meets certain Visual Quality Objectives (VQOs). The objectives of the various VQOs are listed and defined as follows:

> **Preservation** Allows for ecological changes only. Management activities, except for very low visual-impact recreation facilities, are prohibited.
>
> **Retention** Management activities are not evident to the casual forest visitor.
>
> **Partial Retention** Management activities may be evident, but must remain subordinate to the characteristic landscape.
>
> **Modification** Management activities may dominate the characteristic landscape, but must follow naturally established form, line, color, and texture characteristics.
>
> **Maximum Modification** Management activities may dominate the characteristic landscape, but must follow naturally established form, line, color, and texture characteristics and should appear as a natural occurrence when viewed as background.
>
> **Unacceptable Modification** Size of activities is excessive or poorly related to scale of landform and vegetative patterns in characteristic landscape, or overall extent of management activities is excessive, or activities or facilities that contrast in form, line, color, or texture are excessive. All dominance elements in the management activity are visually unrelated to those in the characteristic landscape. Unacceptable modification includes those visual impacts, which exceed 10 years duration patterns (Newburn 2012, p. 21-22).

For the Semi-Primitive Non-Motorized setting (SPNM), a VQO of retention is the norm—Partial Retention would be considered inconsistent with the SPNM class while modification as well as maximum modification would be unacceptable. For the Semi-Primitive Motorized class (SPM), a VQO of partial Retention is the norm—Modification would be considered inconsistent with the SPM class while Maximum Modification would be considered unacceptable.

Regarding Social Encounters, the Norm for both SPNM and SPM is for a recreationist to meet 6-15 parties per day.

The Visitor Impacts indicator is concerned with the prominence of visitor's impacts on the landscape. For both SPNM and SPM settings, the norm is that visitor impacts are subordinate to other natural impacts. No site hardening is the Norm for the SPNM setting while limited site hardening is allowed in

the SPM setting.

Finally, visitor management deals with the degree to which visitors are regulated and controlled as well as the level of information and services provided for visitor enjoyment. For both SPNM and SPM the Norm is subtle on-site regimentation and controls. Only very limited information facilities are present.

3.5.1 Alternative 1

With the no-action alternative there would be no direct effects to any of the ROS setting indicators. However, the indirect effect of Alternative 1 is that there would be a risk of high-severity fire and that risk would continue to increase as the vegetation continues to grow. If a high severity fire does occur, suppression is likely to introduce a large number of firefighters and temporary infrastructure into the IRA which could impact the current ROS setting.

Suppression would likely require extensive fireline, including dozer line. Fireline and dozer line may create opportunities for illegal OHV access in the future, thereby increasing access. If one of these firelines becomes a recognized OHV trail, that would be inconsistent with the access indicator for the SPNM setting.

Suppression of a high intensity fire in the IRA would also introduce a large number of individuals and equipment into the IRA as well as aircraft above the IRA, which would reduce the sense of remoteness because the sights and sounds of human activity would not be distant. Similarly, social encounters would increase during efforts to suppress a high-intensity wildfire.

3.5.2 Alternative 2

Access

Access to the IRA would not be increased under Alternative 2. No new roads or trails would be constructed. Although handline can serve as an unintentional access point for motorized recreation, project design feature REC-3 will minimize illegal OHV use by obscuring the handline by covering it with native materials such as logs, brush, rocks, or forest litter. Past experience with this technique shows that it is effective at preventing the great majority of unauthorized use. In addition, handlines would be monitored after they are covered and, if OHV use is evident, additional techniques would be employed to limit access.

Indirectly, Alternative 2 would likely reduce access in the future. Alternative 2 would reduce the likelihood of a high-intensity fire which could require extensive fireline (including dozer line) to suppress. Preventing OHV use along a dozer line is not as easy as preventing it along a handline, so Alternative 2 would indirectly reduce the likelihood of future illegal OHV use in the IRA.

Remoteness

Remoteness considers the distance of a recreationist from the sights and sounds of human activity as well as the distance from motorized travelways and roads. Under Alternative 2 there would be additional sights and sounds of human activity during project implementation which, depending on the location of the recreationist, could bring sights and sounds within close proximity to the recreationist. However, human activity within the IRA is expected to be of short duration, will be located away from known footpaths, and the prescribed fire itself will be implemented during low use recreation seasons (i.e., before Memorial Day Weekend or after Labor Day Weekend) (project design feature REC-2). Alternative 2 will create no motorized travelways or roads and potential illegal OHV access will be minimized through the use of design feature REC-3.

Indirectly, by reducing the risk of high severity fire, Alternative 2 would reduce the number of fire personnel required to suppress a future fire, thereby maintaining a sense of remoteness into the future.

Naturalness

Under Alternative 2, prescribed fire would cause the charring or blackening of trees to varying extents throughout the project area to create a mosaic burn severity pattern, primarily of low- to moderate-severity surface fires. Passive crown fire over 10% of the project area would cause tree mortality but, to the casual forest user, it would not be evident that the mortality is caused by management activities. For these reasons, prescribed fire is predicted to meet the VQO of Retention or Preservation, which is not inconsistent with SPNM and SPM classes of dispersed recreation.

The thin/prune/pile treatments would create small stumps and piles of fuels that, at least for the short term, would be evident to the casual forest user. However, the overstory would not be removed and would still be subordinate to the overall forested landscape. As a result, thin/prune/pile treatment would meet the VQO of partial retention, which is the norm for the ROS class of SPM. No thin/prune/pile treatments are proposed within SPNM areas so the appropriate VQO for that area should not be compromised. Additional areas could be treated under the thin/prune/pile treatment if new bald eagle nests are discovered, however, given that the SPNM area is more than a mile from Shasta Lake, it is unlikely that any thin/prune pile would occur within the SPNM area.

Social Encounters

The goal for both SPNM and SPM is for a recreationist to encounter fewer than 15 individuals per day. Given that crews of 20 or more firefighters and fuels specialists will be working in a given area at any one time, a recreationist could technically encounter more than 15 parties in a day; however it is unlikely given that the presence of workers will be short-lived, most of the management activity would occur away from the main recreational use corridors, and the prescribed fire itself will be implemented during low use recreation seasons (i.e., before Memorial Day Weekend or after Labor Day Weekend) (project design feature REC-2).

Social encounters of over 15 parties per day are considered inconsistent with the ROS indicator for social encounters. Nevertheless, conditions that are classified as "inconsistent" may still be necessary under some circumstances to meet the management objective (ROS Setting Indicator and Analysis Guide p. 12). Here, breaking up fire crews into smaller parties or ensuring that only 15 workers are present on the landscape at any one time would not be a feasible management strategy. More importantly, the presence of these fire crews will be short lived and, most of the management activity would occur away from the main recreational use corridors, and the prescribed fire itself will be implemented during low use recreation seasons. As a result, conditions would be minimally adverse regarding social encounters but would still be acceptable for SPNM and SPM settings.

Indirectly, Alternative 2 will reduce the risk of high intensity fire which would likely require many more firefighters in the area (including dozers and air support) than would be required during implementation of prescribed fire.

Visitor Impacts

Visitor Impacts deals with the prominence of visitor's impacts on the landscape. Site hardening is part of this indicator.

Although Alternative 2 could potentially attract more hunters to the area (by improving deer and bear habitat), this alternative will not increase concentrated visitor use and visitor impacts will increase over current levels. Although handlines could, potentially, increase illegal OHV use, concealment of the

handlines, monitoring of the area, and follow up treatments when necessary will prevent site hardening and minimize visitor impacts.

Visitor Management

The norm for both SPNM and SPM is to have subtle on-site regimentation and controls as well as very limited information facilities.

Under Alternative 2, there would be no information facilities constructed. The only visitor control would be the concealment of the handlines in order to prevent illegal OHV use. Concealment of handlines is more subtle than signage or so-called "tank-traps" which seek to physically prevent OHV users from riding into the IRA. Not only is concealment more consistent with SPNM and SPM ROS classes, it has been found to be more effective since the existence of a barrier often attracts OHV users since (i) barriers are more visible than logs and duff so those barriers indicate the presence of a potential OHV route and (ii) barriers such as berms and "tank traps" are often an attractive challenge since OHV riders tend to like the difficulty of crossing challenging terrain.

3.5.3 Alternative 3

The effects under Alternative 3 would be of the same type as Alternative 2 but would be reduced in magnitude due to a significant decrease in the acreage of proposed treatments.

3.6 Reference Landscapes

The preamble to the 2001 Roadless Rule explains, "Reference landscapes of relatively undisturbed areas serve as a barometer to measure the effects of development on other parts of the landscape." 2001 Roadless Rule, p. 3245.

The predominant natural disturbance factor within the project area is fire. Before the era of fire suppression, fires were frequent on the landscape and the time between successive fires occurring at the same location (the fire return interval) was short. Based on the best available data, the fire return interval was under 20 years for 74% of the project area, was between 20 and 35 years for 16% of the project area and was greater than 35 years for 10% of the project area (Newburn and Payne 2014, Table 5). Given the forested condition of the project area, most of these fires would have had to have been low-intensity fires that did not kill the majority of the largest trees.

In contrast to natural historical fire regimes, currently over 90 percent of the project area has not experienced fire for over 60 years or more primarily due to active fire suppression. Approximately 91 percent of the project area "missed" 3 or more natural fires that would have been expected to occur without active fire suppression. Fire suppression has largely shaped current vegetation conditions.

3.6.1 Alternative 1

Under alternative 1, the project area would continue to depart from the historic fire return interval. When a wildfire does occur, 63% is anticipated to experience active crown fire which would not mimic the low-intensity fires that occurred historically. Additionally, the stand-replacing fires would create a landscape that is dominated by small trees and brush for at least 20 years, a landscape that would not have been typical under historic conditions.

A wildfire of high intensity would also likely require a major suppression response which would involve extensive use of handlines and possibly dozer lines. While many of the adverse effects of fire suppression would be mitigated, the evidence of this disturbance would remain on the landscape.

3.6.2 Alternative 2

Under alternative 2, fire would be reintroduced on the landscape in the form of prescribed fire. Although prescribed fire has recently been applied to part of the project area part of the Green Mountain project; that project area falls completely outside of the Devil's Rock IRA. Prescribed fire under Alternative 2 would generally be of low intensity with 9% burning as passive crown fire and no active crown fire. Such a fire is at a level of intensity that, if a similar fire burned every 20 years it would not eliminate the overstory.

A future wildfire within the project area would burn 8% of the project area as passive crown fire and 4% as active crown fire. Such a fire would retain the forested character of the project area and, when combined with the prescribed fire, would add two fire occurrences to the fire history, thereby reducing the average fire return interval to a value that is closer to its historic norm.

The thin/prune/pile treatments would create a disturbance on the landscape but in some aspects those treatments would create conditions that resemble historic fire. Thin/prune/pile would remove understory vegetation and reduce forest density much like a low-intensity fire does. On the other hand, the resulting stand would likely be more homogeneous than an area burned with low-intensity fire and the pile burning would have more impact on soil properties than a low-intensity natural fire. In any event, less than 0.2% of the IRA would be treated with thin/prune/pile and 22 of the 30 acres that receive this treatment will occur next to private land on the outer 50 feet of the IRA and would do little to change the character of the IRA as a whole.

Handlines constructed under Alternative 2 may create small negative effects to the mostly undisturbed character of the IRA. Overall, however, the fact that the area will burn less intensely under a wildfire would likely reduce the future suppression response, thereby reducing the extent of future hand and dozer lines within the IRA.

3.6.3 Alternative 3

Under alternative 3, fire would be reintroduced on a portion the landscape in the form of prescribed fire. Although prescribed fire has recently been applied to part of the project area part of the Green Mountain project; that project area falls completely outside of the Devil's Rock IRA. Prescribed fire under Alternative 3 would generally be of low intensity with only 1% burning as passive crown fire and no active crown fire. Such a fire is at a level of intensity that, if a similar fire burned every 20 years it would not eliminate the overstory.

A future wildfire within the project area would burn as passive crown fire over 5% of the project area and as active crown fire across 44% of the project area. The character of the project area would likely be changed, with half of the project area dominated by small trees and brush, a condition that is atypical in the project area. However, this change would be smaller than that under Alternative 1. When combined with the prescribed fire, Alternative 3 would add two fire occurrences to the fire history in at least part of the project area, thereby reducing the average fire return interval to a value that is closer to its historic norm.

The thin/prune/pile treatments would create a disturbance on the landscape but in some aspects those treatments would create conditions that resemble historic fire. Thin/prune/pile would remove understory vegetation and reduce forest density much like a low-intensity fire does. On the other hand, the resulting stand would likely be more homogeneous than an area burned with low-intensity fire and the pile burning would have more impact on soil properties than a low-intensity natural fire. In any event less than 0.2% of the IRA would be treated with thin/prune/pile and (barring new bald eagle nest trees in the IRA) ALL of the area that receives this treatment will occur next to private land on the outer 50 feet of

the IRA and would do little to change the character of the IRA as a whole.

Handlines constructed under Alternative 3 may create small negative effects to the mostly undisturbed character of the IRA. Overall, however, the fact that the area will burn somewhat less intensely under a wildfire would likely reduce the future suppression response, thereby reducing the extent of future hand and dozer lines within the IRA.

3.7 Natural Appearing Landscapes with High Scenic Quality

The preamble to the 2001 Roadless Rule explains, "High quality scenery, especially scenery with natural-appearing landscapes, is a primary reason that people choose to recreate. In addition, quality scenery contributes directly to real estate values in nearby communities and residential areas." 2001 Roadless Rule, p. 3245.

The project area, mostly located within the Whiskeytown-Shasta-Trinity National Recreation Area (NRA), carries the VQO of Retention or Partial Retention, which corresponds to the respective scenic integrity levels of High and Moderate. Some areas, particularly along the Gray Rocks and Devils Rock-Backbone, are scenic attractiveness Class A – Distinctive and have a Very High scenic integrity level. Other areas are characterized as Class B (Typical) or Class C (Indistinctive). A mixture of variety classes (Distinctive, Common and Minimal) can also be found. A discussion of these categories can be found in the Visual Quality report.

Several areas in the vicinity of the project area have had visual quality negatively affected by past wildfires. Much of the Jones Valley area burned in 1999 with high vegetation severity and left the affected landscape devoid of live trees and with dense concentrations of snags and downed logs.

Although fire is a natural component of the ecosystem, recent extreme fire behavior has resulted in uncharacteristically large expanses of severely burned vegetation in many portions of the Shasta-Trinity National Forest. Current fuel conditions in the project area increase the risk that future wildfires will be widespread with high vegetation severity (see the project Fire and Fuels Report and Vegetation Report in the project file). Widespread, severe fire effects are generally considered undesirable from a visual quality perspective. Such effects are often not perceived as appearing natural.

3.7.1 Alternative 1

There would be no direct effects to the appearance of the landscape under this alternative. However, this alternative would not address the current high fuel levels and – when combined with the ongoing agency policy of fire suppression – would increase the risk of a large-scale, high-severity fire. Such a fire would involve 63% of the project area being burned under an active crown fire. Under such a fire the project area would have reduced scenic value due to large expanses of charred or dead trees, denuded vegetation, and residual debris. These visual effects could persist perhaps for decades, until the forest overstory in the affected areas regains dominance over the brush and herbaceous vegetation.

Additionally, in the event of a large-scale fire, protracted periods with smoky skies would create an appearance more commonly associated with urban, polluted landscapes than natural landscapes. Persistent temperature inversions during times of atmospheric stability could trap smoke over large areas (similar to the 1987, 1999, and 2008 wildfires that adversely affected the Redding area), limiting middle ground and background views.

3.7.2 Alternative 2

Temporary reductions in Visual Quality and related Scenic Integrity may occur for a short period of

time but would likely improve considerably over the long term. Only 10% of the project area is expected to experience passive crown fire which means that dead trees will be scattered, solitary or in small clumps, and not dominate the landscape. Studies have shown that recreationists on public lands were generally not surprised or bothered by smoke or fire-damaged vegetation, and that they generally supported prescribed fires in forested areas that had been thinned or cleared to reduce fire danger. Conversely, high-severity fire effects have been repeatedly shown to elicit negative responses from the recreating public.

The prescribed fire would cause the charring or blackening of trees to varying extents throughout the project area. Research has shown that low-intensity burns yielded a slight increase in visits (correlating to favorable scenic quality) when compared to an untreated landscape.

The removal of some of the dense understory through prescribed burning would allow visitors to see further into the forest – allowing for more varied foreground and middleground views. More forest openings would also enhance visual diversity in form, color, texture, and scale which is seen as more interesting or visually desirable than a homogeneous landscape. Studies have shown that desirable aesthetic effects are created and sustained through fuels reduction treatments such as prescribed fire.

Thin/Prune/Pile treatments would create a temporary reduction visual quality in the immediate foreground at the site because of the existence of piled material and small, low-cut stumps. Thin/prune/pile would take up less than 0.2% of the IRA and would primarily occur immediately adjacent to private property boundaries where the evidence of human presence is already high. A small (6 acre) area around a bald eagle nest would also receive the thin/prune/pile treatment but, given the nest's location, this treatment will only be viewed from a distance so the piled material and stumps would not be visible to the great majority of recreationists.

Indirectly, Alternative 2 would reduce the risk of high severity fire. Under alternative 2, a future wildfire would only burn 8% of the project as a passive crown fire and 4% as an active crown fire. Such a fire would not result in a dramatic visual change from the pre-wildfire landscape. If a wildfire occurs only a few years after the prescribed fire, the negative visual effects of wildfire and prescribed fire would likely be additive, possibly creating an obvious reduction in scenic value. However, if a longer period of time elapses between the two fires (based on past experience in the Green Mountain Project, prescribed fires are mostly unnoticeable after about four years or so) only the negative effects of the wildfire would be visible.

3.7.3 Alternative 3

Most effects of Alternative 2 also apply to this alternative but are reduced in scale due to a significant decrease in the acreage of proposed treatments. Direct reductions to visual quality as a result of the proposed treatments would be reduced. However, indirect positive effects would also be reduced as a future wildfire is expected to consume 44% of the project area under an active crown fire.

3.8 Traditional Cultural Properties and Sacred Sites

The preamble to the 2001 Roadless Rule explains, "Traditional cultural properties are places, sites, structures, art, or objects that have played an important role in the cultural history of a group. Sacred sites are places that have special religious significance to a group. Traditional cultural properties and sacred sites may be eligible for protection under the National Historic Preservation Act. However, many of them have not yet been inventoried, especially those that occur in inventoried roadless areas." 2001 Roadless Rule, p. 3245.

A Traditional Cultural Property (TCP) can be defined as a historic or prehistoric site that is eligible for

inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (Parker and King 1998).

There are no Traditional Cultural Properties or sacred sites within the Green Horse Project Area that are known to the Forest Service. As part of the public involvement process and tribal consultation process the Forest Service used scoping and other means to notify the following tribal groups: Redding Rancheria, Pit River Tribe, Winnemem Wintu Tribe, Wintu Tribe of Northern California, United Tribes of Northern California. Most of the tribal groups did not respond to the materials and the responses that were received did not express any concern regarding the project (see Heritage Report for more information). Adjacent landowners and the public at large were also notified of the project and neither of those groups mentioned the existence of a TCP or sacred site.

Unlike historic sites and archaeological sites, the determination of whether a site is a TCP or a sacred site depends on the beliefs and cultural practices of specific individuals. Without information from an affected community or group of people, a survey alone is insufficient to identify new TCPs or sacred sites. Indeed, some groups may choose to restrict information on the nature or location of TCPs or sacred sites to members of the group until the group believes that such a site is threatened. For these reasons, we can conclude that based on the best information available, TCPs or sacred sites within the project area will not be adversely affected by the Green Horse Project.

3.9 Other Locally Defined Unique Characteristics

The preamble to the 2001 Roadless Rule explains, "Inventoried roadless areas may offer other locally identified unique characteristics and values. Examples include uncommon geological formations, which are valued for their scientific and scenic qualities, or unique wetland complexes. Unique social, cultural or historical characteristics may also depend on the roadless character of the landscape. Examples include ceremonial sites, places for local events, areas prized for collection of non- timber forest products or exceptional hunting and fishing opportunities." 2001 Roadless Rule, p. 3245.

The FEIS for the STNF Land and Resource Management Plan identifies three unique characteristics of the Devil's Rock IRA. These are: limestone outcroppings which are visually pleasing, Shasta salamander which occupies the limestone outcrops, sensitive plants present in the area (USDA Forest Service 1994a, pg. C-10).

3.9.1 Alternative 1

There would be no direct effects to any of the unique characteristics of the Devil's Rock IRA. Indirectly, a high-severity wildfire would not harm the limestone outcrops themselves, and would in fact improve the visibility of the limestone. While the scenery as a whole would be harmed under a high-intensity fire, view of the outcrops themselves would be better and that unique feature would be improved.

High intensity wildfire could harm some Shasta salamander individuals although the lower fuel levels found around limestone outcrops (where the salamander is most common) would likely cause the level of harm to be small.

Regarding sensitive plants, high intensity wildfire would result in a moderate long-term adverse indirect effect to at least six Sensitive plant and fungi species (*Boletus pulcherrimus, Cypripedium fasciculatum, Cypripedium montanum, Mielichhoferia elongata, Neviusia cliftonii,* and *Phaeocollybia olivacea*) but might be beneficial to the other five Sensitive plant and fungi species (*Clarkia borealis ssp. borealis, Eriastrum tracyi, Fritillaria eastwoodiae, Lewisia cantelovii*, or *Sedum obtusatum ssp. paradisum*) due

to the opening up of the forest canopy.

3.9.1 Alternative 2

No direct effects to the limestone outcrops would occur under Alternative 2. The outcrops themselves would not be affected and the low intensity fire would not increase their visibility. Similarly, a future wildfire is expected to have a similar low intensity and would not improve visibility of the limestone outcrops either.

Direct effects to Shasta salamanders are unlikely to occur due to the requirement of a 300 foot buffer from limestone habitats for all activities that may directly or indirectly affect Shasta salamanders or their important habitat elements. Because of the very low density of individuals within non-limestone areas, project implementation is unlikely to affect populations. The reduced risk of high intensity fire would likely provide some protection to salamander habitat in the future.

Prescribed fire can be expected to cause some direct mortality to plants but the surviving individuals would benefit from increased nutrients and light. Pile burning may also have a negative effect to Sensitive plant and fungi species given the higher soil temperatures experienced under piles; however, design features that exclude pile burning from riparian areas and the small extent of pile burning is expected to keep these effects negligible and short-term. Hand thinning and pruning will similarly have little to no effect on known occurrences of Sensitive plant and fungi species given project design features. In short, implementation of Alternative 2 may impact, but is not likely to lead to a trend toward Federal listing or loss of viability for the eleven Forest Service Sensitive plant and fungi species analyzed.

In the longer term, the reduction in intensity of a future wildfire would be expected to benefit at least six Sensitive plant and fungi species (*Boletus pulcherrimus*, *Cypripedium fasciculatum*, *Cypripedium montanum*, *Mielichhoferia elongata*, *Neviusia cliftonii*, and *Phaeocollybia olivacea*). Since such a future wildfire is still predicted to create openings across 21% of the landscape, the long term effects of Alternative 2 to the other five Sensitive plant and fungi species (*Clarkia borealis ssp. borealis*, *Eriastrum tracyi*, *Fritillaria eastwoodiae*, *Lewisia cantelovii*, or *Sedum obtusatum ssp. paradisum*) are not predicted to be negative.

3.9.3 Alternative 3

No direct effects to the limestone outcrops would occur under Alternative 2. The outcrops themselves would not be affected and the low intensity fire would not increase their visibility. However, a future wildfire is expected to behave as an active crown fire across 44% of the project area, which could improve views of the outcrops if the crown fire burns area around the outcrops. However, the benefit of such a fire would likely be lower than under alternative 1.

Direct impacts to the Shasta salamander and sensitive plants will be smaller. Indirect effects, specifically the reduction in the amount of habitat loss expected to result from a severe wildfire, will also be less under Alternative 3 than alternative 2. In other words, for species that are harmed by severe wildfire, Alternative 3 is expected to have a smaller positive indirect effect than Alternative 2.

Table 1. Summary of Effects to Roadless Characteristics

Roadless Characteristics	Roadless Character Descriptions (2001 Roadless Rule, p. 3245)	Would the project benefit, adversely affect, or be neutral to the roadless character?
High Quality or Undisturbed Soil, Water and Air Resources	"These three key resources are the foundation upon which other resource values and outputs depend. Healthy watersheds catch, store, and safely release water over time, protecting downstream communities from flooding; providing clean water for domestic, agricultural and industrial uses: helping maintain abundant and healthy fish and wildlife populations; and are the basis for many forms of outdoor recreation."	**Alternative 1**: No short term direct effects followed by mid- to long-term adverse indirect effects. **Alternative 2**: Air quality - direct adverse negative effects followed by mid- to long-term beneficial indirect effects Soils - beneficial short and long-term effects. Water Quality - direct neutral effect followed by mid- to long-term beneficial indirect effects. **Alternative 3**: Same effects as alternative 2 but lower magnitude.
Sources of Public Drinking Water [See the Hydrology Report for More Information]	"Maintaining [watersheds contributing to drinking water] in a relatively undisturbed condition saves downstream water filtration costs. Careful management of these watersheds is crucial in maintaining the flow and affordability of clean water to a growing population."	**Alternatives 1, 2, and 3**: No effect.
Diversity of Plant and Animal Communities	"Roadless areas are more likely than roaded areas to support greater ecosystem health, including the diversity of native and desired nonnative plant and animal communities due to the absence of disturbances caused by roads and accompanying activities. Inventoried roadless areas also conserve native biodiversity by serving as a bulwark against the spread of nonnative invasive species."	**Alternative 1**: No direct effects. Diversity would decrease under a future wildfire burning at 90th percentile conditions. Future wildfire poses a risk of invasive plant colonization. **Alternative 2**: Direct effects of this alternative would be increases in diversity and, at most, a minimal introduction of invasive plants. After future wildfire, additional increases in diversity are expected along with rates of invasive plant colonization that are smaller than under alternative 1. **Alternative 3**: Direct effects of this alternative would be a minor increase in diversity and, at most, a minimal introduction of invasive plants. Diversity would decrease as a result of future wildfire but not as much as under Alternative 1. Rates of invasive plant colonization under future wildfire is expected to be greater than under alternative 2 but smaller than under Alternative 1.

Roadless Characteristics	Roadless Character Descriptions (2001 Roadless Rule, p. 3245)	Would the project benefit, adversely affect, or be neutral to the roadless character?
Habitat for Threatened, Endangered, Proposed, Candidate, and Sensitive Species and Species Dependent on Large Undisturbed Areas of Land [See the Botany BE, Wildlife BA, Wildlife BE, and Fisheries BE for More Information]	"Roadless areas serve as biological strong holds and refuges for many species. Roadless areas support a diversity of aquatic habitats and communities, providing or affecting habitat for more than 280 TES species."	**Alternative 1**: No direct effects followed by adverse indirect effects for 6 of 11 sensitive plant and fungi species, the bald eagle, the fisher, the Shasta salamander, and sensitive aquatic species. Indirect effects to the Northern Spotted Owl would be negative but negligible. **Alternative 2**: Direct effects of Alternative 2 to Sensitive plants and fungi would be slightly negative but the effects are not likely to lead to a trend toward federal listing or loss of viability. Alternative 2 would indirectly benefit 6 of 11 Sensitive plant and fungi species and indirectly have neutral or beneficial effects to the other 5 species. Alternative 2 will have no effect to the gray wolf. Direct effects to Northern Spotted Owl habitat might be slightly negative but would maintain habitat function and are not expected to affect the owl through impacts to its prey. Indirect effects of reducing the risk of high-intensity wildfire would be beneficial but likely negligible. Alternative 2 would have no direct negative effects to the bald eagle, fisher, or Shasta salamander but would have indirect beneficial effects due to the lower risk of high-intensity future wildfire. Direct negative effects to aquatic species may occur but would not cause a trend toward federal listing or a loss of viability. Indirectly, the lower risk of high severity fire will be beneficial to the species. **Alternative 3:** Direct and indirect effects of alternative 3 to sensitive and threatened species will be similar to those of alternative 2 but smaller in magnitude.
Primitive and Semi-Primitive Non-motorized, and Semi- primitive Motorized classes of Dispersed Recreation	"Roadless areas often provide outstanding dispersed recreation opportunities such as hiking, camping, picnicking, wildlife viewing, hunting, fishing, cross-country skiing and canoeing. These areas can also take pressure off heavily used wilderness areas by providing solitude and quiet, and dispersed recreation opportunities."	**Alternative 1:** No direct effects. Indirect adverse effects to access, remoteness, and social encounters due to the continued risk of high severity fire which will bring more individuals into the area and may increase long-term access. **Alternative 2:** Direct effects will be neutral to the following indicators: access, remoteness, naturalness, facilities and site management, visitor impacts, and visitor management. Minimal adverse impacts to social encounters due to the number of fire managers within the IRA. Indirect beneficial effects to access, remoteness, and social encounters can be

Roadless Characteristics	Roadless Character Descriptions (2001 Roadless Rule, p. 3245)	Would the project benefit, adversely affect, or be neutral to the roadless character?
		expected due to reduced risk of high severity fire which will bring more individuals into the area and may improve long-term access. **Alternative 3:** Effects are similar to those of Alternative 2 (where they exist) but smaller in magnitude.
Reference Landscapes	"Reference landscapes of relatively undisturbed areas serve as a barometer to measure the effects of development on other parts of the landscape"	**Alternative 1**: No short term direct effects followed by adverse indirect effects due to high-intensity fire. **Alternative 2:** Direct effects would be primarily beneficial due to the application of low intensity fire although there would be minor adverse effects due to thin/prune/pile and handline construction. Indirect effects would be positive due to the reduction of intensity of future wildfires to levels that are more in line with the historic range of variability. **Alternative 3**: Direct effects (both beneficial and adverse) under Alternative 3 would be similar to those of Alternative 2 but smaller in magnitude. Indirect effects would be positive due to the reduction of intensity of future wildfires; however, the ultimate state of the landscape after a future wildfire would be worse than it currently is (but not as bad as after a wildfire burning under Alternative 1).
Natural Appearing Landscapes with High Scenic Quality [See the Visual Quality Report for More Information]	"High quality scenery, especially scenery with natural-appearing landscapes, is a primary reason that people choose to recreate. In addition, quality scenery contributes directly to real estate values in nearby communities and residential areas."	**Alternative 1:** No direct effects followed by adverse indirect effects due to the effect of a high intensity fire on scenic quality. **Alternative 2**: Minor negative direct effects primarily due to tree mortality followed by beneficial indirect effects due to the reduction in severity of a future wildfire. **Alternative 3**: Minor negative direct effects primarily due to tree mortality followed by minor beneficial indirect effects due to the small reduction in severity of a future wildfire.

Roadless Characteristics	Roadless Character Descriptions (2001 Roadless Rule, p. 3245)	Would the project benefit, adversely affect, or be neutral to the roadless character?
Traditional cultural properties and sacred sites [See the Heritage Report for More Information]	"Traditional cultural properties are places, sites, structures, art, or objects that have played an important role in the cultural history of a group. Sacred sites are places that have special religious significance to a group. Traditional cultural properties and sacred sites may be eligible for protection under the National Historic Preservation Act. However, many of them have not yet been inventoried, especially those that occur in inventoried roadless areas."	**Alternatives 1, 2, and 3:** No effect
Other locally identified unique characteristics	"Inventoried roadless areas may offer other locally identified unique characteristics and values. Examples include uncommon geological formations, which are valued for their scientific and scenic qualities, or unique wetland complexes. Unique social, cultural or historical characteristics may also depend on the roadless character of the landscape. Examples include ceremonial sites, places for local events, areas prized for collection of non- timber forest products or exceptional hunting and fishing opportunities." For Devil's Rock IRA: Limestone outcroppings which are visually pleasing, Shasta salamander which occupies the limestone outcrops, Presence of sensitive plants	**Alternative 1:** No direct effects to any of the unique characteristics. Beneficial indirect effects for the limestone outcrops (based on improved visibility due to high-severity fire). Adverse indirect effects to the Shasta salamander and 6 of 11 sensitive plant and fungi species. **Alternative 2:** No direct or indirect effects to the limestone outcrops or their visibility. Alternative 2 would have no direct negative effects to the Shasta salamander but would have indirect beneficial effects due to the lower risk of high-intensity future wildfire. Direct effects of Alternative 2 to Sensitive plants and fungi would be slightly negative but the effects are not likely to lead to a trend toward federal listing or loss of viability. Alternative 2 would indirectly benefit 6 of 11 Sensitive plant and fungi species and indirectly have neutral or beneficial effects to the other 5 species. **Alternative 3**: No direct effects to limestone outcrops. Beneficial indirect effects to limestone outcrops (based on improved visibility due to high-severity fire). Direct and indirect effects of Alternative 3 to the Shasta salamander and sensitive plants/fungi will be similar to those of Alternative 2 but smaller in magnitude.

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Appendix A